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MOTOROLA, INC.
1303 EAST ALGONQUIN ROAD
IL01/3RD
SCHAUMBURG, IL 60196

EXAMINER	
BROWN JR, NATHAN H	
ART UNIT	**PAPER NUMBER**
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docketing.Schaumburg@motorola.com
APT099@motorola.com

Office Action Summary	Application No.	Applicant(s)	
	10/711,191	XIAO ET AL.	
	Examiner	Art Unit	
	NATHAN H. BROWN JR	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Examiner's Detailed Office Action

1. This Office is responsive to the communication for application 10/711,191, filed Novemeber 16, 2007.

2. Claims 1-19 have been examined.

3. After the previous examination, claims 1-19 stood rejected.

Claim Rejections - 35 USC § 112, 1st

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1 and 4-19 are rejected under 35 U.S.C. 112, first paragraph. Specifically, if the application fails as a matter of fact to satisfy 35 U.S.C. § 101, then the application also fails as a matter of law to enable one of ordinary skill in the art to

use the invention under 35 U.S.C. § 112.; In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) MPEP 2107.01 (IV).

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1 and 4-12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter: mathematical abstraction and/or algorithm. Independent claim 1 recites claim a "neural network" comprising a plurality of nodes and directed edges and a training process. The final result recited is "summing the first summand and the additional summands, wherein, in estimating said derivative, paths from said second node to said output node that involve said third plurality of directed edges are not considered". Examiner considers a list of nodes and edges to be no more that a recitation of a graph model. Examiner considers the training process to be no more than an algorithm. Therefore claim 1

recites no more than the 101 judicial exceptions of mathematical abstraction and algorithm and is considered non-statutory under 35 U.S.C. 101. Claims 4-12 provide detailed algorithm limitation to claim 1 and thus fail to cure the deficiency of claim 1. Therefore, claims 1 and 4-12 are non-statutory under 35 U.S.C. 101.

8. Claims 13-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter: algorithm. Independent claim 13 recites a "method of training a neural network" with the graph structure of claim 1. The final result of the training is "summing the first summand and the additional summands, wherein, in estimating said derivative, paths from said second node to said output node that involve said third plurality of directed edges are not considered" which is considered to be a numerical value representing no credible or specific real-world result. Claims 14-19 provide detailed algorithm limitation to claim 13 and thus fail to cure the deficiency of claim 13. Therefore, claims 13-19 are non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 4-7, 11, 13, 14, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by ***Fahlman*** *et al.* (*Fahlman*), "The Cascade-Correlation Learning Architecture", 1990.

Regarding claim 1. *Fahlman* teaches a neural network comprising:

a first node (*see* p. 4, Fig. 1, *Examiner "Hidden Unit 1" to be a first node*.) ;

a second node adapted to receive and process signals from said first node (*see* p. 4, Fig. 1, *Examiner interprets "Hidden Unit 2" to be a second node adapted to receive and process signals from said first node*.);

a first directed edge between said first node and said second node for transmitting signals from said first node to

said second node, wherein said first directed edge is characterized by a first weight (*see* p. 4, Fig. 1, *Examiner interprets the output path from "Hidden Unit 1" to intersecting the vertical path to "Hidden Unit 2" be a first directed edge between said first node and said second node for transmitting signals from said first node to said second node. Examiner interprets the "X connection" between "Hidden Unit 1" and "Hidden Unit 2" to be a first weight.*);

an output node adapted to receive and process signals from said second node (*see* p. 4, Fig. 1, *Examiner interprets the left most "Outputs" to be an output node adapted to receive and process signals from said second node.*);

a second directed edge between said second node and said output node for transmitting signals from said second node to said output node, wherein said second directed edge is characterized by a second weight (*see* p. 4, Fig. 1, *Examiner interprets the output path from "Hidden Unit 2" intersecting the vertical path to the left most "Outputs" to be a second directed edge between said second node and said output node for transmitting signals from said second node to said output node, wherein said second directed edge is characterized by a second weight. Examiner interprets the "X connection" between "Hidden Unit 1" and the left most "Outputs" to be a second weight.*);

a plurality of additional nodes between said second node and said output node (*see* p. 4, Fig. 1, *Examiner interprets "Hidden Unit 2" to be a subset of a plurality of additional nodes "hidden units" (see Abstract) between said second node and said output node.*);

a first plurality of directed edges coupling said second node to said plurality of additional nodes (*see* p. 4, Fig. 1, *Examiner interprets the output path from "Hidden Unit 2" intersecting the vertical paths to each of said plurality of additional nodes to be a first plurality of directed edges coupling said second node to said plurality of additional nodes.*);

a second plurality of directed edges coupling said plurality of additional nodes to said output node (*see* p. 4, Fig. 1, *Examiner interprets the output path from each of said plurality of additional nodes intersecting the vertical path to the left most "Outputs" to be a second plurality of directed edges coupling said plurality of additional nodes to said output node.*);

a third plurality of directed edges coupling signals from nodes among said plurality of additional nodes to other nodes among said plurality of additional nodes that are closer to said output node (*see* p. 3 and p. 4, Fig. 1, §2. Description of

Cascade-Correlation, "We add hidden units to the network one by one. Each new hidden unit receives a connection from each of the network's original inputs and also from every pre-existing hidden unit. The hidden unit's input weights are frozen at the time the unit is added to the net; only the output connections are trained repeatedly.", *Examiner interprets the "output connections" of "hidden units" to the "input connections" of "hidden units" be a third plurality of directed edges coupling signals from nodes among said plurality of additional nodes to other nodes among said plurality of additional nodes that are closer to said output node.*);

wherein, said first weight has a value that is determined by a process of training said neural network (*see* p. 4, Fig. 1, *Examiner interprets a "X connetions" between units to be a weight that has a value that is determined by a process of training said neural network* .) that comprises:

estimating a derivative of a summed input to said output node with respect to said first weight by:

multiplying a signal output by said first node by a value of a derivative of a transfer function of said second node that obtains when training data is applied to said neural network to obtain a first factor;

multiplying said first factor by said second weight to compute a first summand;

for each particular node of the plurality of additional nodes between said second node and said output node, computing an additional summand by multiplying together the first factor, a weight characterizing one of the first plurality of directed edges that couples the second node to the particular node, a weight characterizing one of the second plurality of directed edges that couples the particular node to the output node, and a value of a transfer function of the particular node; and

summing the first summand and the additional summands, wherein, in estimating said derivative, paths from said second node to said output node that involve said third plurality of directed edges are not considered (*see* p. 5, "After computing $\delta S/\delta w_i$ for each incoming connection, we can perform a gradient ascent to maximize S. Once again we are training only a single layer of weights. Once again we use the quickprop update rule for faster convergence.", *Examiner interprets gradient ascent using quickprop to comprise the above training steps.*).

Regarding claim 13. *Fahlman* teaches a method of training a neural network that comprises:

a first node (*see* p. 4, Fig. 1, *Examiner "Hidden Unit 1" to be a first node.*);

a second node adapted to receive and process signals from said first node (*see* p. 4, Fig. 1, *Examiner interprets "Hidden Unit 2" to be a second node adapted to receive and process signals from said first node.*);

a first directed edge between said first node and said second node for transmitting signals from said first node to said second node, wherein said first directed edge is characterized by a first weight (*see* p. 4, Fig. 1, *Examiner interprets the output path from "Hidden Unit 1" to intersecting the vertical path to "Hidden Unit 2" be a first directed edge between said first node and said second node for transmitting signals from said first node to said second node. Examiner interprets the "X connection" between "Hidden Unit 1" and "Hidden Unit 2" to be a first weight.*);

an output node adapted to receive and process signals from said second node (*see* p. 4, Fig. 1, *Examiner interprets the left most "Outputs" to be an output node adapted to receive and process signals from said second node.*);

a second directed edge between said second node and said output node for transmitting signals from said second node to said output node, wherein said second directed edge is characterized by a second weight (*see* p. 4, Fig. 1, *Examiner interprets the output path from "Hidden Unit 2" intersecting the vertical path to the left most "Outputs" to be a second directed edge between said second node and said output node for transmitting signals from said second node to said output node, wherein said second directed edge is characterized by a second weight. Examiner interprets the "X connection" between "Hidden Unit 1" and the left most "Outputs" to be a second weight.*);

a plurality of additional nodes between said second node and said output node (*see* p. 4, Fig. 1, *Examiner interprets "Hidden Unit 2" to be a subset of a plurality of additional nodes "hidden units" (see Abstract) between said second node and said output node.*);

a first plurality of directed edges coupling said second node to said plurality of additional nodes; a second plurality of directed edges coupling said plurality of additional nodes to said output node (*see* p. 4, Fig. 1, *Examiner interprets the output path from "Hidden Unit 2" intersecting the vertical paths to each of said plurality of additional nodes to be a first*

plurality of directed edges coupling said second node to said plurality of additional nodes.);

a third plurality of directed edges coupling signals from nodes among said plurality of additional nodes to other nodes among said plurality of additional nodes that are closer to said output node (*see* p. 3 and p. 4, Fig. 1, §2. Description of Cascade-Correlation, "We add hidden units to the network one by one. Each new hidden unit receives a connection from each of the network's original inputs and also from every pre-existing hidden unit. The hidden unit's input weights are frozen at the time the unit is added to the net; only the output connections are trained repeatedly.", *Examiner interprets the "output connections" of "hidden units" to the "input connections" of "hidden units" be a third plurality of directed edges coupling signals from nodes among said plurality of additional nodes to other nodes among said plurality of additional nodes that are closer to said output node*.);

the method comprising:

estimating a derivative of a summed input to said output node with respect to said first weight by:

multiplying a signal output by said first node by a value of a derivative of a transfer function of said second

node that obtains when training data is applied to said neural network to obtain a first factor;

multiplying said first factor by said second weight to compute a first summand;

for each particular node of the plurality of additional nodes between said second node and said output node, computing an additional summand by multiplying together the first factor, a weight characterizing one of the first plurality of directed edges that couples the second node to the particular node, a weight characterizing one of the second plurality of directed edges that couples the particular node to the output node, and a value of a transfer function of the particular node; and

summing the first summand and the additional summands, wherein, in estimating said derivative, paths from said second node to said output node that involve said third plurality of directed edges are not considered (*see* p. 5, "After computing $\delta S/\delta w_i$ for each incoming connection, we can perform a gradient ascent to maximize S. Once again we are training only a single layer of weights. Once again we use the quickprop update rule for faster convergence.", *Examiner interprets gradient ascent using quickprop to comprise the above training steps*.).

Regarding claim 4. *Fahlman* teaches the neural network according to claim 1 wherein said first node comprises an input of said neural network (*see* p. 4, Fig. 1, *Examiner interprets any "Inputs" to be a first node.*).

Regarding claim 5. *Fahlman* teaches the neural network according to claim 1 wherein said first node comprises a hidden processing node of said neural network (*see* p. 4, Fig. 1, *Examiner "Hidden Unit 1" to be a first node.*).

Regarding claim 6. *Fahlman* teaches the neural network according to claim 1 wherein: said plurality of additional nodes include sigmoid transfer functions (*see* p. 3, "In the experiments we have run so far, we use a symmetric sigmoidal activation function (hyperbolic tangent) whose output range is -1.0 to +1.0.").

Regarding claims 7 and 14. *Fahlman* teaches the neural network according to claim 1 and method of training the neural network according to claim 13 wherein said process of training said neural network comprises:

(a) applying training data to said neural network, whereby said summed input is generated at said output node;

(b) computing a value of a derivative of an objective function that depends on said derivative of said summed input to said output node with respect to said first weight;

(c) processing said derivative of said objective function with an optimization algorithm that uses derivative information; and

(d) repeating (a)-(c) until a stopping condition is satisfied (*see* pp. 3-5, "We run a number of passes over the examples of the training set, adjusting the candidate unit's input weights after each pass… When S stops improving, we install the new candidate as a unit in the active network, freeze its input weights, and continue the cycle as described above.", *Examiner interprets gradient ascent using quickprop to comprise steps (a)-(d).*).

Regarding claims 11 and 18. *Fahlman* teaches the neural network according to claim 10 and method of training the neural network according to claim 17 wherein: the objective function is a function of a difference an actual output of said neural network that depends on said summed input to said output node and an expected output (*see* p. 5, *Examiner interprets S to be an objective function to be maximized. Examiner interprets* V_p *to be a candidate unit's value which depends on a summed input for*

pattern p. Examiner interprets Vbar to be the average or expected output of the candidate unit over all patterns, p.); and the objective function is a continuously differentiable function of a measure of near zero weights (*see* p. 5, *Examiner interprets* $\delta S/\delta w_i$ *to be a continuously differentiable function of a measure of near zero weights as* σ_o *is just a sign function and* f'_p *is the first derivative of a symmetric sigmoidal activation function (hyperbolic tangent) or* $1/\cosh^2(x)=1/(e^x + e^{-x}/2)$ *which approaches 2 when the summed input, x, approaches zero for near zero weights.*).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being

unpatentable over ***Fahlman*** in view of ***Mashiko*** (USPN: 5,202,956).

Regarding claim 2. *Fahlman* teaches the neural network according to claim 1. *Fahlman* does not teach said first directed edge, said second directed edge, said first plurality of directed edges and said second plurality of directed edges comprise one or more amplifying circuits. *Mashiko* does teach said first directed edge, said second directed edge, said first plurality of directed edges and said second plurality of directed edges comprise one or more amplifying circuits (see Fig. 1 and col. 4, lines 51-54, Examiner interprets the "the converting portion in FIG. 1" to be a directed (output) edge.). It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Fahlman* with *Mashiko* in order to provide multi-valued expression of coupling strength with fewer coupling elements.

Claim Rejections - 35 USC § 103

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Fahlman*** in view of ***Smyth*** (USPN: 6,092,058).

Regarding claim 3. *Fahlman* teaches the neural network according to claim 1. *Fahlman* does not teach said first directed edge, said second directed edge, said first plurality of directed edges, and said second plurality of directed edges comprise one or more attenuating circuits. *Smyth* does teach said first directed edge, said second directed edge, said first plurality of directed edges, and said second plurality of directed edges comprise one or more attenuating circuits (*see* Fig. 5 and col. 4 lines 29-38, *Examiner interprets "the attenuations of the circuit model are the linear expansion coefficient weights" to each connection (edge) in the cerebrum model is an attenuating circuit.*). It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Fahlman* with *Smyth* in order to attain high levels of decision classification accuracy by combining a parametric model of cerebral potential with advanced techniques drawn from numerical analysis, artificial intelligence, and nonlinear regression analysis.

14. Claims 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fahlman* in view of *Watrous*, "Learning

Algorithms for Connectionist Networks: Applied Gradient Methods of Nonlinear Optimization”, 1988.

Regarding claims 8 and 15. *Fahlman* teaches the neural network according to claim 7 and method of training the neural network according to claim 14. *Fahlman* does not teach the said process of training said neural network, processing said derivative of said objective function comprises: using a nonlinear optimization algorithm selected from the group consisting of the steepest descent method, the conjugate gradient method, and the Broyden-Fletcher-Goldfarb-Shanno method. However, *Watrous* does teach the said process of training said neural network, processing said derivative of said objective function comprises: using a nonlinear optimization algorithm selected from the group consisting of the steepest descent method, the conjugate gradient method, and the Broyden-Fletcher-Goldfarb-Shanno method (*see* Abstract). It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Fahlman* with *Watrous* in order to utilize additional information about the shape of the weight space to obtain dramatically faster convergence.

Response to Arguments

15. Applicant's arguments filed November 16, 2007 have been fully considered but they are not persuasive.

Rejection of Claims 1-12 and 13-19 Under 35 U.S.C. §101

Applciants argue:

> One assertion made in the Office Action is that the applicant's claims are directed to a "mathematical abstraction". Set Theory or the Fundamental Theorem of Calculus may be considered to be "mathematical abstractions" but an apparatus for processing signals such as a neural network is not a "mathematical abstraction".

Examiner responds:

> Examiner disagrees. A neural network, as claimed by Applicants, in independent claim 1, is nothing more than a listing of nodes, edges, weights, and arithmetic operations. Nodes, edges, weights are clearly recognizable as entities from the theory of weighted directed graphs. The arithmetic operations over the nodes, edges, and weights are well known in simple vector-matrix arithmetic.

Applciants argue:

> As indicated in the applicant's specification neural networks, including the applicant's claimed neural network

> can be implemented using analog or digital electronics and in either form the claimed neural network is not a "mathematical abstraction". (It is noted that the applicant's independent claims are not so narrow as to be restricted to analog or digital electronics. One of ordinary skill in the art can implement the applicant's claimed neural networks using analog or digital circuitry.)

Examiner responds:

Examiner reminds Applicants, that it is not what Applicants invention *can* be, but what it is claimed to be that Applicants seek to exclude others from using. Applicants do not *claim* any type of implementation (not even software per se). Clearly, Applicants seek to exclude others from applying certain vector-matrix arithmetic operations to a particular graph structure. This is considered to be non-statutory as nothing other than the 101 judicial exceptions of mathematical abstraction and arithmetic algorithm (i.e., the operations in the claimed order) are recited in the claims.

Applciants argue:

> The utility of neural networks for processing signals is well known to workers in various advanced fields of electrical engineering.

Examiner responds:

Examiner agrees. However Applicants recite no physical transformation or useful, concrete, and tangible final

result in independent claims 1, 4-12, or 13-19. Therefore, Applicants claims a considered to have no utility.

Applciants argue:

> In the case of the neural networks claimed in claims 1-12, such an algorithm is not abstract and detached from practical utility, rather it is part of a signal processor that as such has practical utility.

Examiner responds:

Applicants have not claimed a signal processor. Examiner reminds Applicants that a signal processor, per se, is considered to be no more than a mathematical entity that performs the analysis, interpretation, and manipulation of signals (i.e., a functional).

Applciants argue:

> In rejecting the applicants claims under 35 U.S.C. §101 the office action also asserted that the claims 1-12 were drawn to a "computer related manufacture".

Examiner responds:

Applicants' argument is moot, based on new grounds of rejection under 35 U.S.C. §101.

Applciants argue:

> Despite the lack of utility for such components or sub-systems, in isolation, such components and sub-systems are statutory under 35 U.S.C. §101. The standards of 35 U.S.C. §101 and 35 U.S.C. §112 are such that one can obtain a patent on a component or sub-system without describing in the patent specification the details of larger systems in which the component or sub-system is used. A patent on a

carburetor is unlikely to include any information on the number and arrangement of cylinders in engines in which the carburetor may be used. Person's of ordinary skill in the art recognize the ordinary uses of components or sub-systems and it is impractical to cover the details and numerous variations of the larger systems. Neural networks have been under development since that the 1970's and known uses exist in various fields including control systems and pattern recognition (e.g., facial recognition). Thus, the applicant has not described in detail larger systems in which the applicant's claimed neural networks can be incorporated.

Examiner responds:

Examiner disagrees. Examiner considers that it is still the direction of The Office to find a claim to be directed to one of the statutory classes and, if it is a process claim, to recite more than just a 101 judicial exception and have practical application. Examiner finds no practical application of Applicants' invention to be disclosed. Examiner considers Applicant's disclosure to provide only a demonstration of a number of different optimization algorithms that use derivative evaluation (see Specification, p. 29 of 59) to neural network training. Such results are considered to be directed to solution of problems in optimization theory and to thus be theoretical, rather than specific and credible real-world results (e.g., the final share price of *State Street*).

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nathan H. Brown, Jr.
August 21, 2008

/David R Vincent/

Supervisory Patent Examiner, Art Unit 2129